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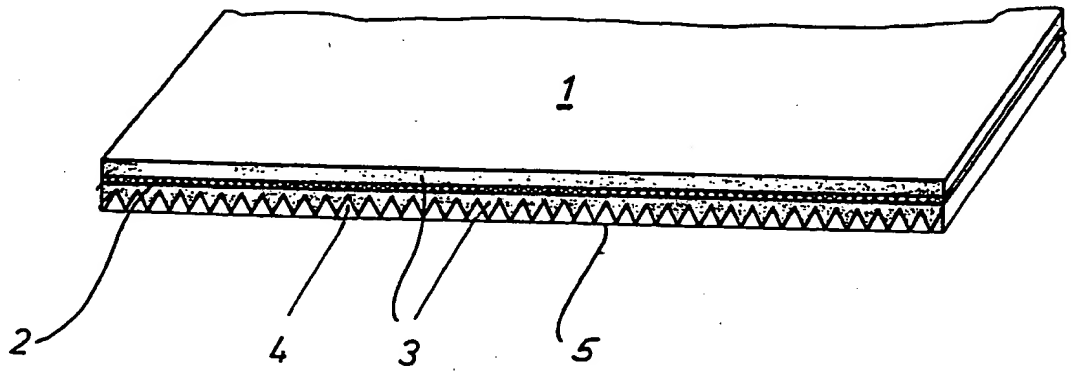

(57) Abstract

A bituminous sheet or web coating material (1) is on the one side provided with a heat activatable adhesive layer (3) optionally covered by a plastic film (5), wherein the adhesive layer is provided with a pattern of close grooves (4) with intermediate unbroken ridges, and a process for forming a coating on a support is performed by heating such coating material (1) to decomposition of said plastic film (5) and activation of the adhesive layer (3), the activated adhesive layer (3) being pressed against the support, e.g. a roof.

* See back of page

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A bituminous coating material and a process for producing a bituminous coating on a support

The present invention relates to a bituminous coating sheet or web material provided on the one side with a heat activatable adhesive layer which is optionally coated with a plastic film.

In particular, the invention relates to a bituminous web-formed coating material for the formation of a roof covering.

It is known to produce roofings by using roofing felt webs, i.e. bituminous felt lengths, coated with a plastic film of e.g. polyethylene or polypropylene and having a thickness of about 10 μm,

It is the main function of the plastic film to prevent adjacent parts of the roofing felt webs from sticking to each other when said webs are stored and transported in rolls.

The heating of the roofing felt webs is typically carried out by use of propane gas burners.

When the flame, which has a typical temperature of 1000-1300°C, is directed towards the plastic film coated adhesive layer, the plastic film decomposes and burns away and the adhesive layer is activated. The use of such gas burners is associated with a certain fire hazard as sometimes the support or other parts of the roof construction catch fire.

The said flame heating is further associated with the drawback that the decomposition of the plastic film is often incomplete and therefore areas remain where the adhesive layer is covered with film residues and, as a consequence, the desired adhesion is not obtained.

DK patent publication No. 150 586 B discloses a process for producing a bituminous coating on a support, provided with pressure equalization zones. In this known process a bituminous web material which, on the adhesive side being provided with rows of projections of an adhesive consisting of a mixture of bitumen and a

thermoplastic elastomer, is adhered to the support. Said rows are typically spaced apart about 30 mm and the projections have a maximum length of 50 mm, a typical width of 15 mm and a height of 1-3 mm.

The formation of said projections on the bituminous sheet material is effected by producing initially a sand-strewn bituminous web material and then rolling thereon the adhesive in its melted state using a pattern embossing roll.

The known material is appropriate for the formation of a coating with pressure equalization zones, but it is unsuitable for the formation of a fully adhered coating as, although the adhesive is heated enough for the projections to spread, it is not possible to obtain a uniform adhesive layer. Moreover, the known material is associated with the drawback that it is difficult to obtain complete removal of the film described above, as a part of said film remains on top of the said projections.

The coating material according to the invention is characterized in that a pattern of parallel grooves and intermediate unbroken ridges is provided in the adhesive layer, the distance between adjacent grooves not exceeding 10 mm.

The coating material according to the invention is surprisingly found to present a variety of technical advantages.

Firstly, such a material may be used not only for forming a fully adhered coating on a support, viz. by heating all parts of the groove-patterned adhesive layer, but also for forming a coating which prevents humidity and/or air under pressure in entrapped zones from accumulating during the coating process. The latter is obtained by heating the adhesive layer in such a manner that it is adhered to the support in separate zones, the grooves of the non-adhered zones serving as pressure equalization channels.

As compared to the coating material disclosed in DK patent publication No. 150 586, the material according to the invention is moreover simpler and thus less expensive to produce, the production

thereof not requiring the application of an additional adhesive layer of a particular composition.

Furthermore, said groove pattern in the adhesive layer permits a vastly enhanced heat exchange between the hot gas stream on the one side and the plastic film and the adhesive layer on the other side when the removal of a plastic film fixed to the adhesive layer is to be carried out prior to adhering the material to a support. The improved heat exchange causes the removal of the plastic film to be substantially faster and more efficient and the adhesive layer to be more efficient activated than when the known coating material disclosed above is used.

The practical consequence is that when using a propane gas flame for heating the energy requirement is reduced.

In practice the reduced energy requirement means that it is possible to increase the laying out rate of roofing felt having an adhesive layer, which consists primarily of bitumen, from about 1.0 m/min to about 1.4 m/min which means that the energy consumption per m is reduced from about 61 g gas/m to about 45 g gas/m.

When laying out roofing felt with a 15 cm overlap, experiments in practice have proved it possible to increase the rate from 0.8 m/min to about 1.5 m/min, which means that the energy consumption is reduced from 63 W/m to 33 W/m.

The surprisingly improved heat exchange is also expressed by the fact that, when carrying out the process according to the invention, flameless heating of the plastic film and the adhesive layer may be carried out, said flameless heating, which may e.g. be carried out with an air stream having a temperature of from 200 to 800°C, having surprisingly proved to effect the complete removal of the plastic film and the activation of an adhesive layer of bitumen.

The use of such a flameless gas stream of a relatively low temperature eliminates substantially fire hazards.

The distance between the grooves in the adhesive layer is, as stated

above, no more than 10 mm and according to a preferred embodiment the distance is between 1 and 5 mm which means that the grooves are situated relatively closely to each other. The height of the projections as measured from the bottom of the grooves is preferably comprised within the range of from 0.5 to 6 mm and particularly preferred within a range of from 1 to 3 mm.

Preferably the grooves in the adhesive layer extend in the longitudinal direction of the web material and thus, they can be produced by combing of the adhesive layer in connection with the production of the sheet material when the adhesive layer is still hot and viscous.

However, said grooves may also extend perpendicularly to said direction or at any other angle relative to the longitudinal direction.

The adhesive layer may consist of usual adhesive asphalt (bitumen), but it may also contain a self-adhesive polymer or resin.

The plastic film may e.g. have a thickness of from about 10 μm, but in practice films with thicknesses of from 3 to 30 μm can be used.

The invention further relates to a process for producing a waterproof, bituminous coating on a support and in particular a roof covering, wherein a sheet or web coating material, which, on the one side being provided with a heat activatable adhesive layer covered by a plastic film, is heated to decompose said plastic film and to activate the adhesive layer and the activated adhesive layer is pressed against the support, said process being characterized in that the material according to the invention described above is used as the coating material.

A particularly preferred embodiment of the process according to the invention is characterized in that the heating is carried out with a flameless hot air stream.

Such air stream may e.g. be produced by electrically heating a stream of atmospheric air.

The heating may also be carried out by heat radiation, e.g. by use of internally heated heating means or by IR heat radiation.

The invention will be further described in greater detail with reference to the accompanying drawing which represents a schematical perspective view of a preferred embodiment for a roofing web according to the invention.

In the drawing 1 denotes a roofing web comprising a felt layer 2 and an adhesive layer 3. The adhesive layer 3 is on the inside of the web 1 provided with grooves 4 which extend in the longitudinal direction of the web material 1. The grooved adhesive layer 3 is coated with a plastic film 5 which abuts substantially only the tops of the ridges between the grooves 4.

Claims

1. A bituminous sheet or web coating material provided on the one side with a heat activatable adhesive layer optionally covered by a plastic film, characterized in that the adhesive layer is provided with a pattern of parallell grooves and intermediate unbroken ridges, the distance between adjacent grooves not exceeding 10 mm.

2. A coating material according to claim 1, characterized in that the distance between adjacent grooves is between 1 and 5 mm.

3. A coating material according to claims 1 or 2, characterized in that the height of the ridges as measured from the bottom of the grooves is from 0.5 to 6 mm and preferably from 1 to 3 mm.

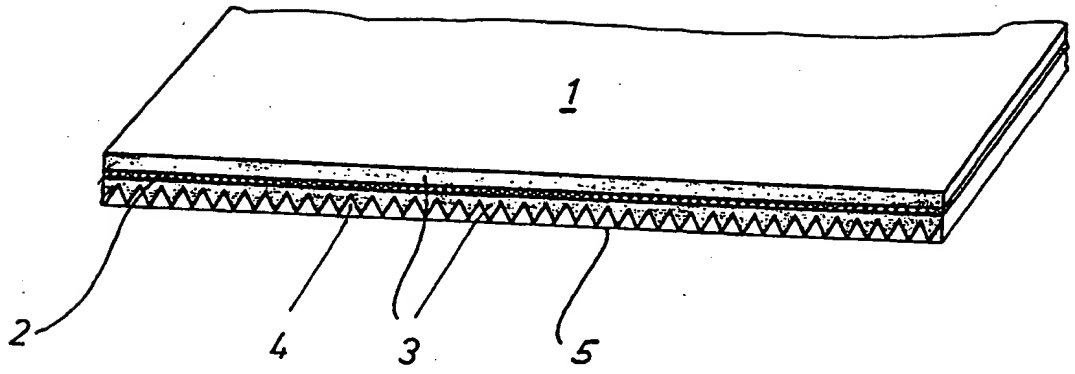
4. A coating material according to any one of claims 1, 2 or 3, characterized in that the grooves extend in the longitudinal direction of the sheet material.

5. A coating material according to any one of the preceding claims, characterized in that the plastic film is of a thickness of from 3 to 30 μm.

6. A process for the production of a bituminous coating on a support, wherein a sheet or web coating material provided with a heat activatable adhesive layer covered by a plastic film is heated to decompose the plastic film and to activate the adhesive layer, and the activated adhesive layer is pressed against the support, characterized in using a coating sheet material in which the adhesive layer is provided with a pattern of parallel grooves and intermediate unbroken ridges, the distance between adjacent grooves not exceeding 10 mm.

7. A process according to claim 6, characterized in in that the distance between adjacent grooves is from 1 to 5 mm.

8. A process according to claims 6 or 7, c h a r a c t e r i z e d in using a flameless hot air stream for heating the plastic film and the adhesive layer.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INTERNATIONAL SEARCH REPORT

International Application No PCT/DK 90/00179

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all)[6]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC5: E 04 D 5/02

II. FIELDS SEARCHED

Minimum Documentation Searched[7]

Classification System	Classification Symbols
IPC5	E 04 D

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in Fields Searched[8]

SE,DK,FI,NO classes as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT[9]

Category *	Citation of Document,[11] with indication, where appropriate, of the relevant passages[12]	Relevant to Claim No.[13]
Y	DK, B, 150586 (AKTIESELSKABET JENS VILLADSENS FABRIKER) 1 December 1986, see page 5 - page 6 example 1 --	1-8
Y	FR, A3, 2544361 (DE. KOHL GMBH & CIE DACHBELAG- UND BAUTENSCHUTZMITTEL-FABRIK) 19 October 1984, see details 3 and 4 --	1-8
Y	GB, A, 2146270 (TAJIMA ROOFING CO. LTD.) 17 April 1985, see figure 2 details 26 and 27 --.	1-8

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* Special categories of cited documents: [10]

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IV. CERTIFICATION

Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report
3rd October 1990	1990 -10- 11
International Searching Authority	**Signature of Authorized Officer**
SWEDISH PATENT OFFICE	Vilho Juvonen

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON INTERNATIONAL PATENT APPLICATION NO.PCT/DK 90/00179

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the Swedish Patent Office EDP file on 90-08-28
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Patent document cited in search report	Publication date	Patent family member(s)		Publication date
DK-B- 150586	86-12-01	NONE		
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